

PLANARIZING MACHINES AND CONTROL SYSTEMS FOR MECHANICAL
AND/OR CHEMICAL-MECHANICAL PLANARIZATION OF MICROELECTRONIC
SUBSTRATES

ABSTRACT

A system for controlling a mechanical or chemical-mechanical planarizing machine comprises a light system, a sensor, and a computer. The light system can have at least a first emitter that generates a first light pulse having a first color and a second emitter that generates a second light pulse having a second color different than the first color. The first and second light pulses reflect from a microelectronic substrate in a manner that creates a first return light pulse corresponding to a reflectance of the first light pulse and a second return light pulse corresponding to a reflectance of the second light pulse. The sensor receives the first return light pulse and the second return light pulse, and the sensor generates a first measured intensity of the first return light pulse and a second measured intensity of the second return light pulse. The computer has a database and a computer readable medium. The database contains a plurality of sets of reference reflectances in which each set has a first reference component defined by a reflectance intensity of the first light pulse and a second reference component defined by a reflectance intensity of the second light pulse from a selected surface level in a layer of material on the microelectronic substrate. The computer readable medium contain a computer readable program that causes the computer to control a parameter of the planarizing machine when the first and second measured intensities correspond to the first and second reference components of a selected reference reflectance set.